

The Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)



“Building Technologies for Tomorrow’s Coasts”

Why CICEET?



Pollution and degradation of estuarine and coastal systems continues

There is a role for new technologies in addressing contamination, degradation and restoration



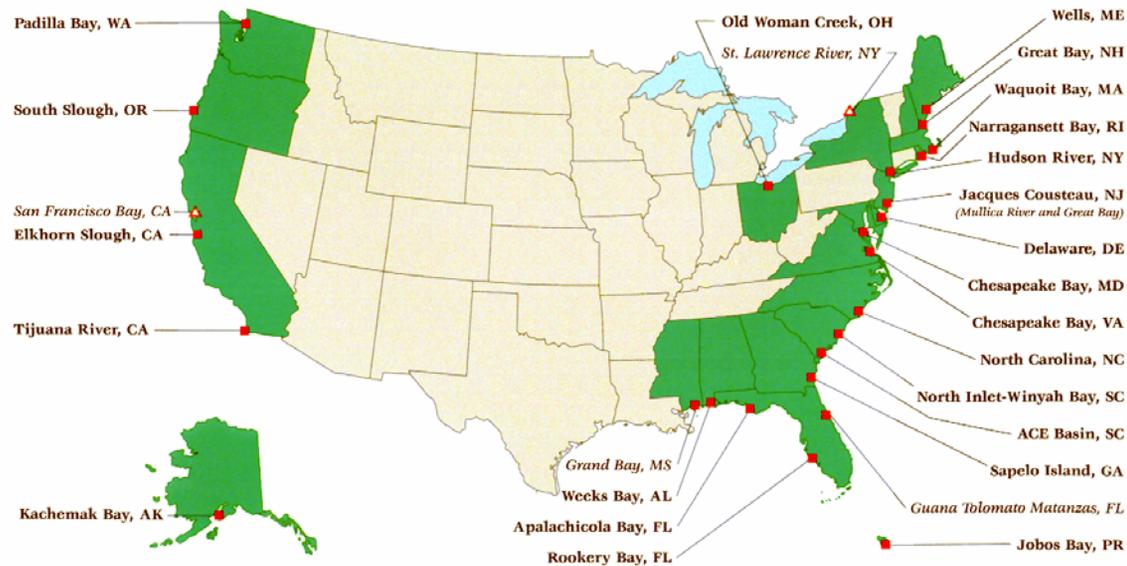
There is a need to connect technology developers and coastal scientists with end users throughout the process

CICEET is a Partnership



National Perspective through NERRS

Location of CICEET Funded Projects in the National Estuarine Research Reserve System



CICEET sites **bold type**
designated ■
proposed ▲



December 1999



Mission

To understand and reverse the impacts of coastal and estuarine contamination through the development and application of innovative environmental technologies and methods.

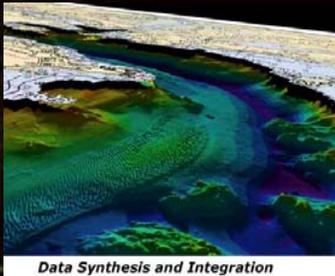


CICEET's Goals

1. Develop Innovative Technologies
2. Transfer Technology to the User
3. Enhanced Technology Capabilities for the NERRS

CICEET Focus Areas...

- Toxic Contaminants
- Nutrients and Eutrophication
- Microbial Pathogens
- Habitat Restoration
- Data Synthesis & Integration



Funding Opportunities in FY 2003

Environmental Technology Grants

- *Up to \$3.5 million for new projects*

Development Grants

- *Up to \$120 K for “proof of concept” projects (\$5-15K each)*

Technology Transfer Grants

- *Up to \$750,000*
- *Limited to existing CICEET projects*

CICEET Program Activities

- Technology Evaluation and Verification Program
- CICEET-OR&R Technology Research Initiative
- Technology Transfer Workshops
- Communications

What makes a CICEET Project...

- Outcome rather than output
- Problem solving rather than problem defining
- Technology development not description of estuarine processes
- Useful tools and products rather than interesting research
- Broadly applicable rather than site specific
- Novel rather than same old-same old
- Technological advance rather than incremental step
- The environmental and the economy are the endpoints, not journal articles

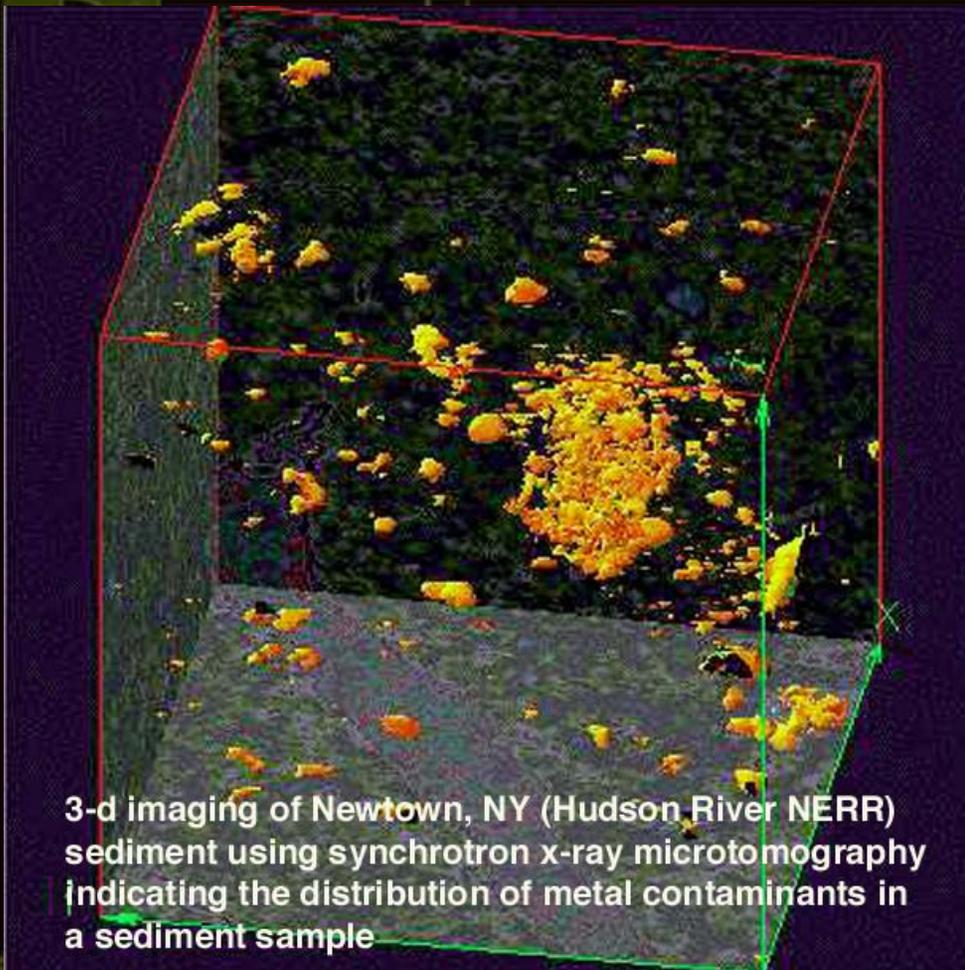
Contaminated Sediment Remediation



Disposal of contaminated sediments dredged from ship channels can cost upwards of \$3 billion annually

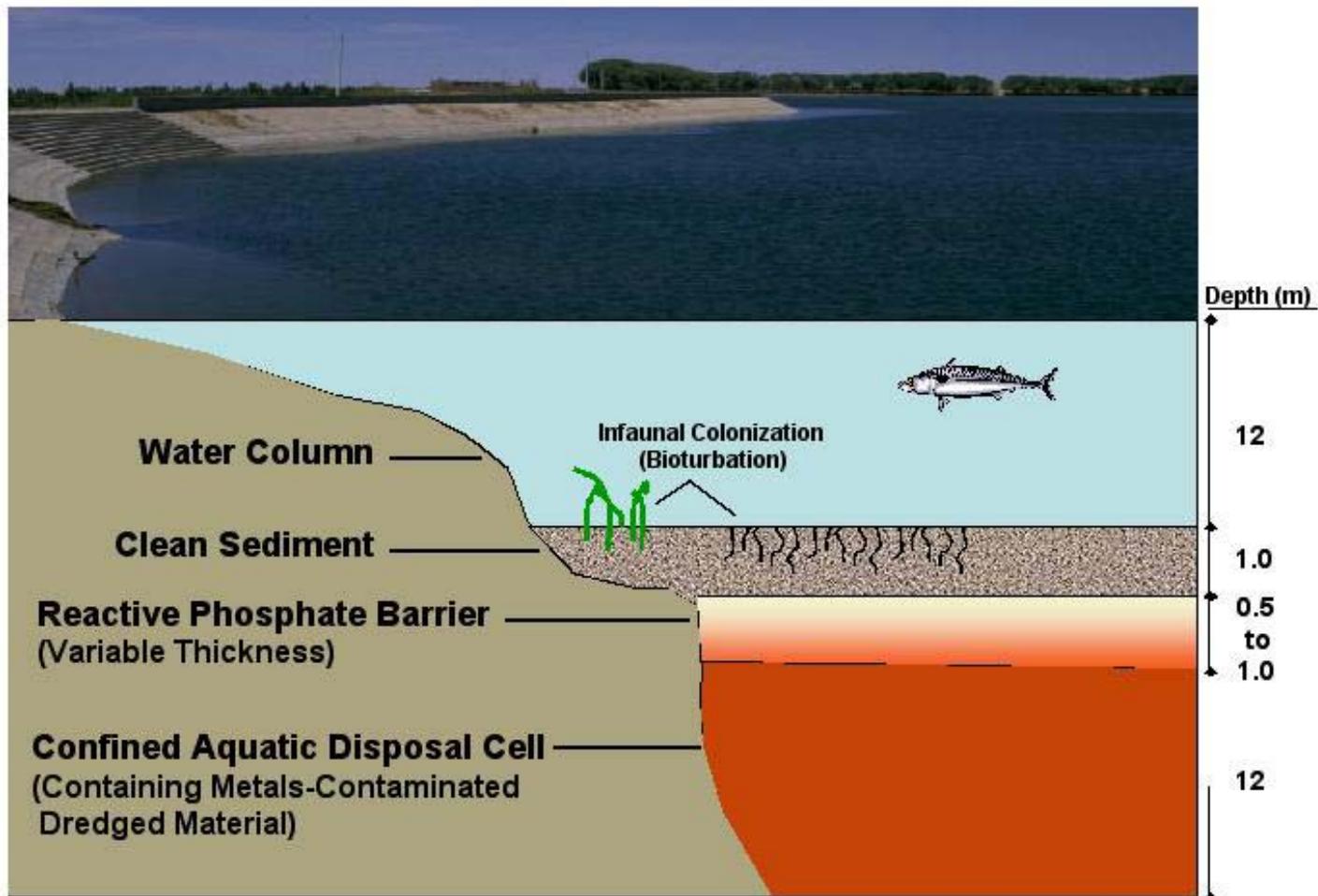
Contaminated sediments pose human health and ecological risk. Disposal of contaminated sediments significantly increases the cost of dredge disposal

Contaminated Sediment Remediation

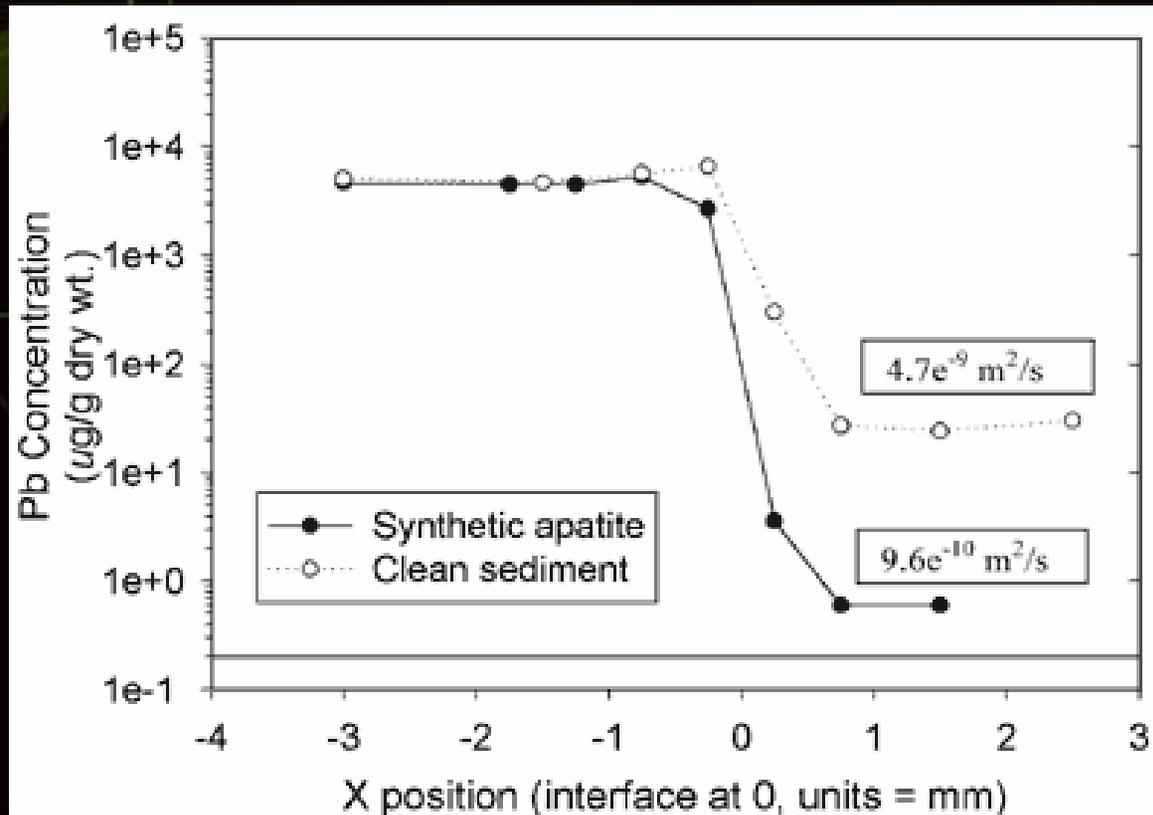


A UNH project is evaluating phosphate stabilization treatments for sediments contaminated with heavy metals. The research is being conducted in Great Bay, NH, Hudson River, NY, and Narragansett Bay, RI

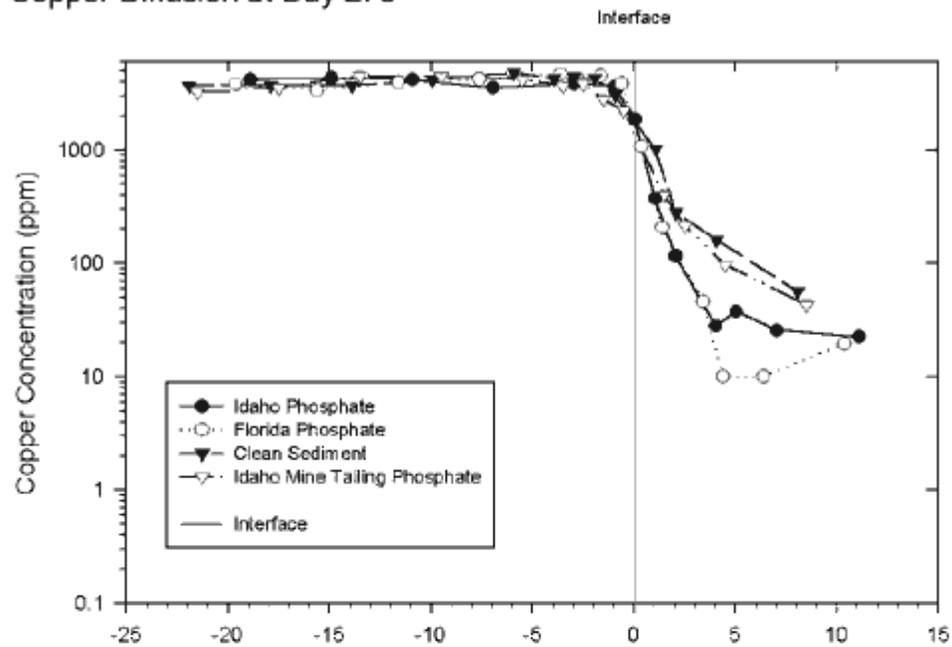
Phosphate Barrier Schematic



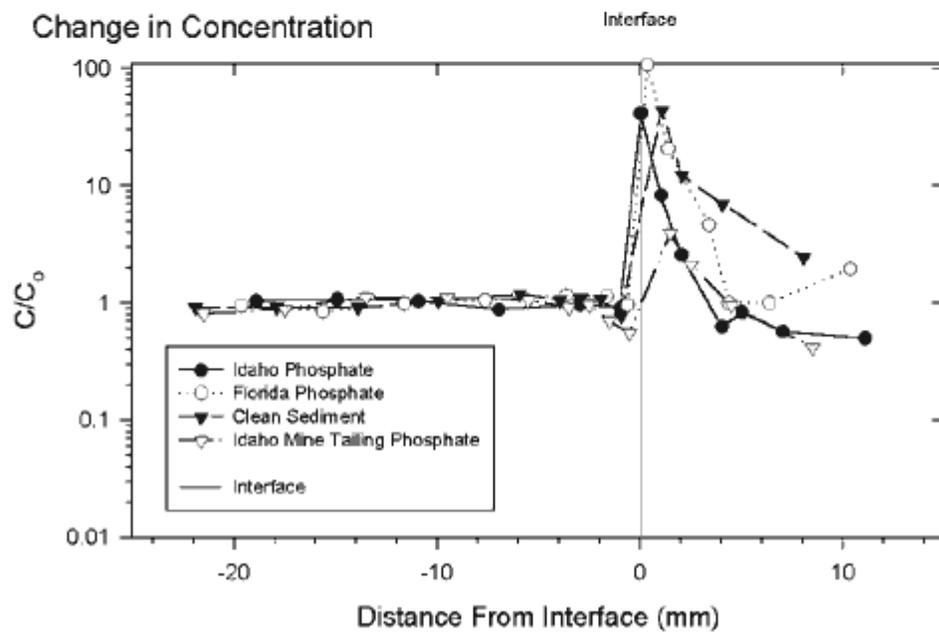
Heavy Metal Response



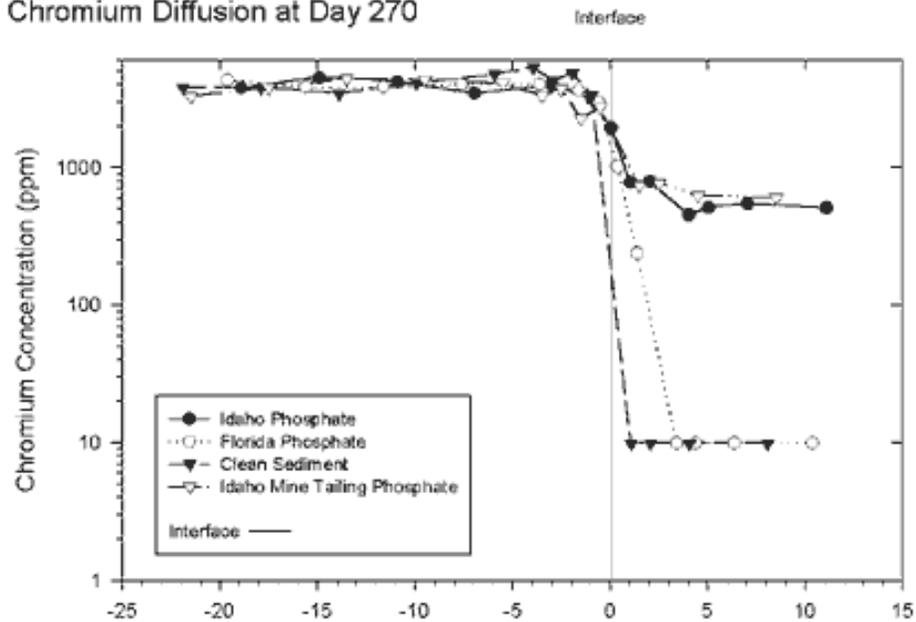
Copper Diffusion at Day 270



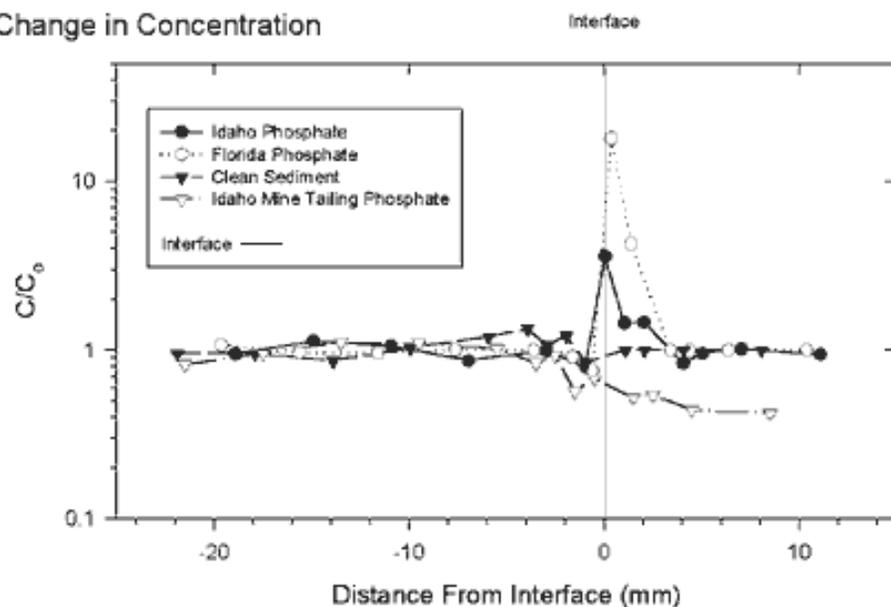
Change in Concentration



Chromium Diffusion at Day 270



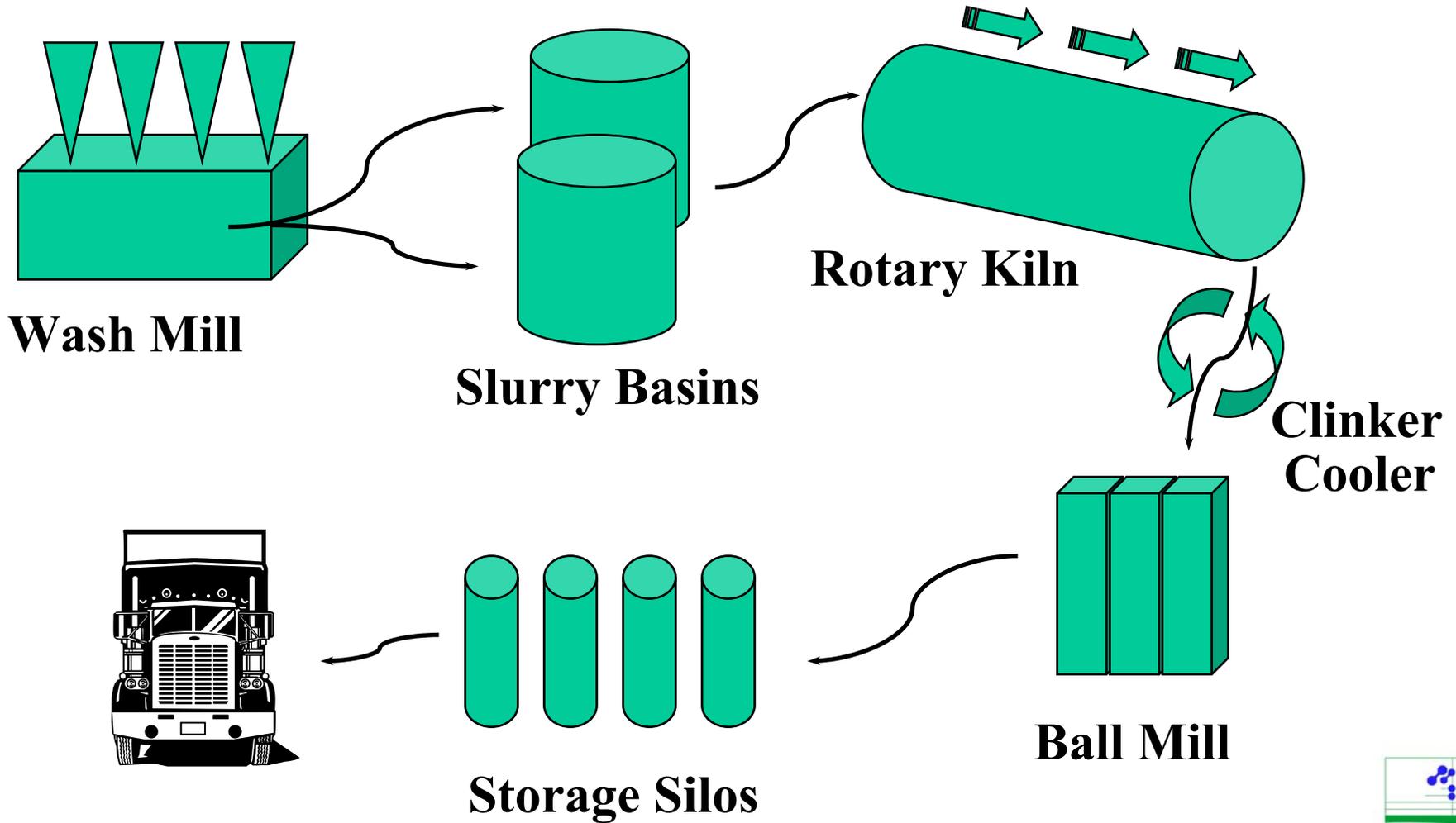
Change in Concentration



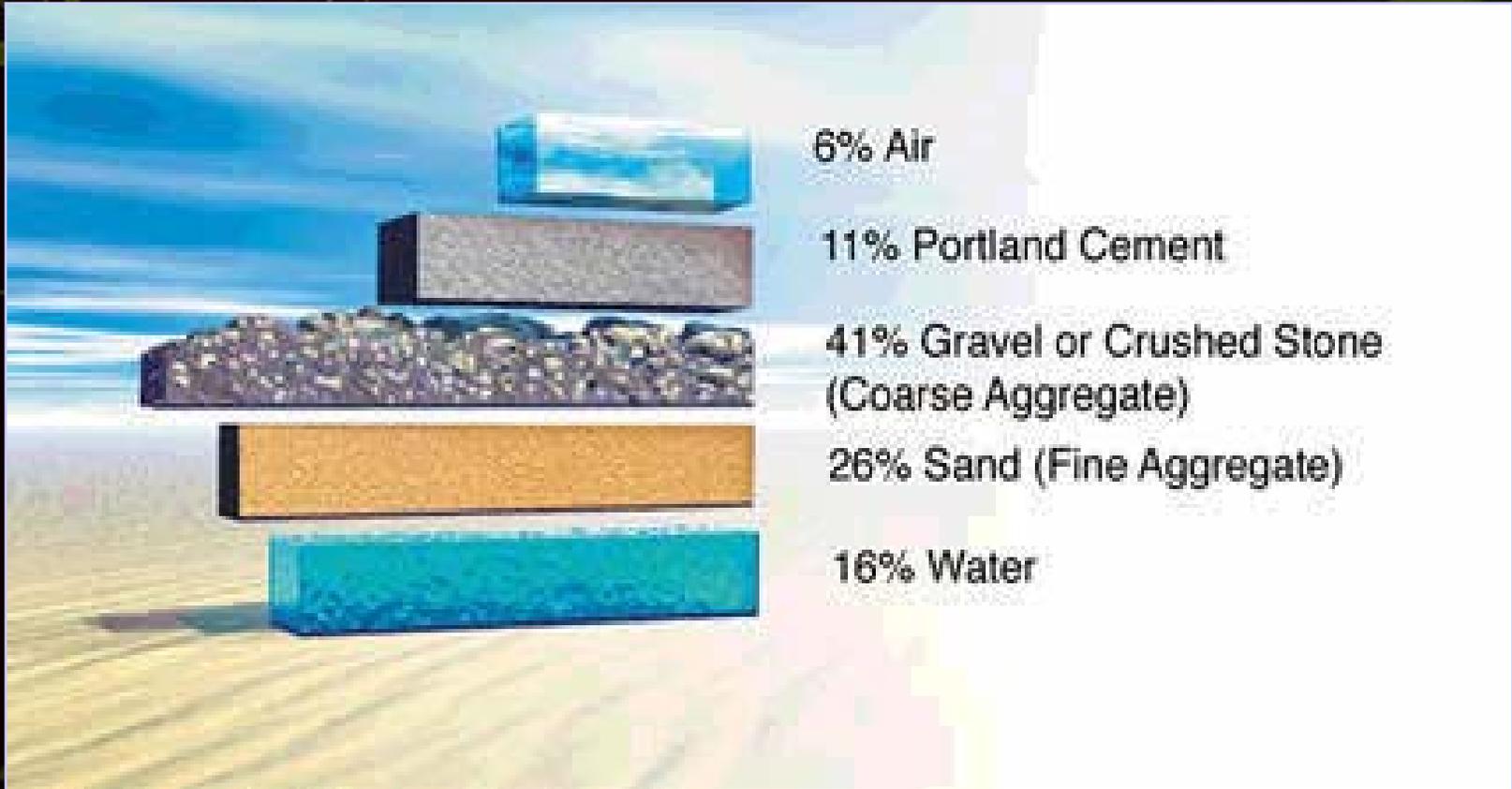
Beneficial Use of Dredge Spoil



Typical Cement Manufacturing Process (Wet)

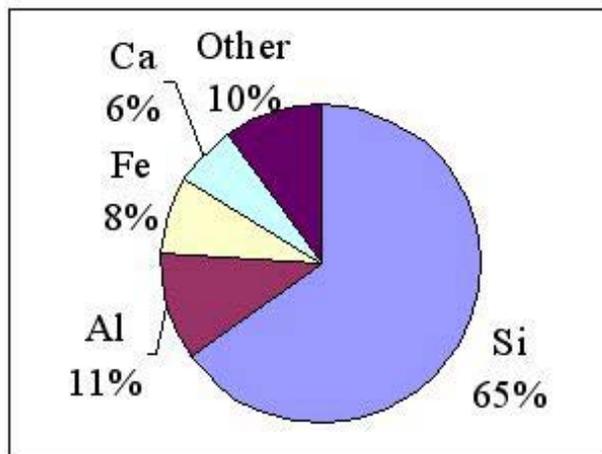


Concrete Composition

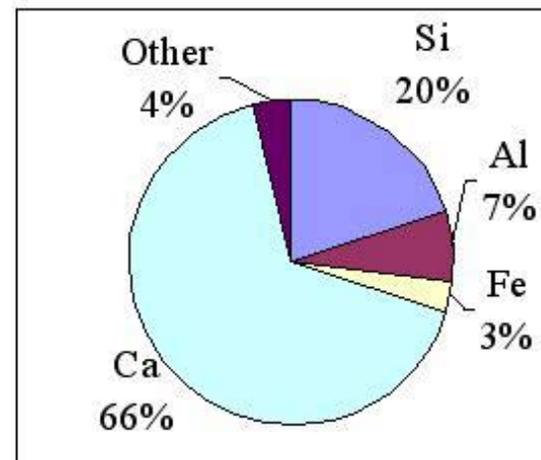


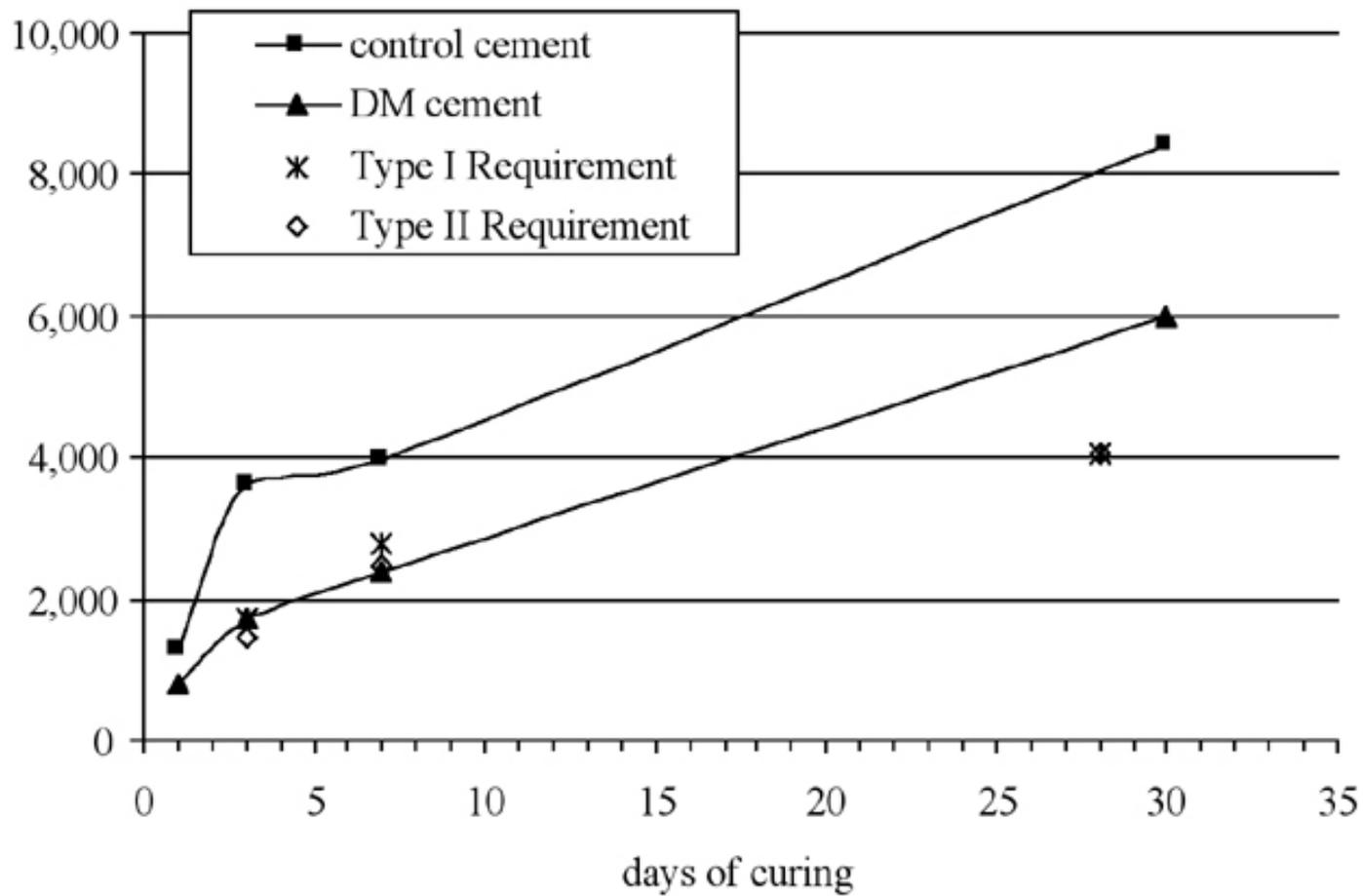
Typical Major Element Concentrations

Dredged Material



Cement





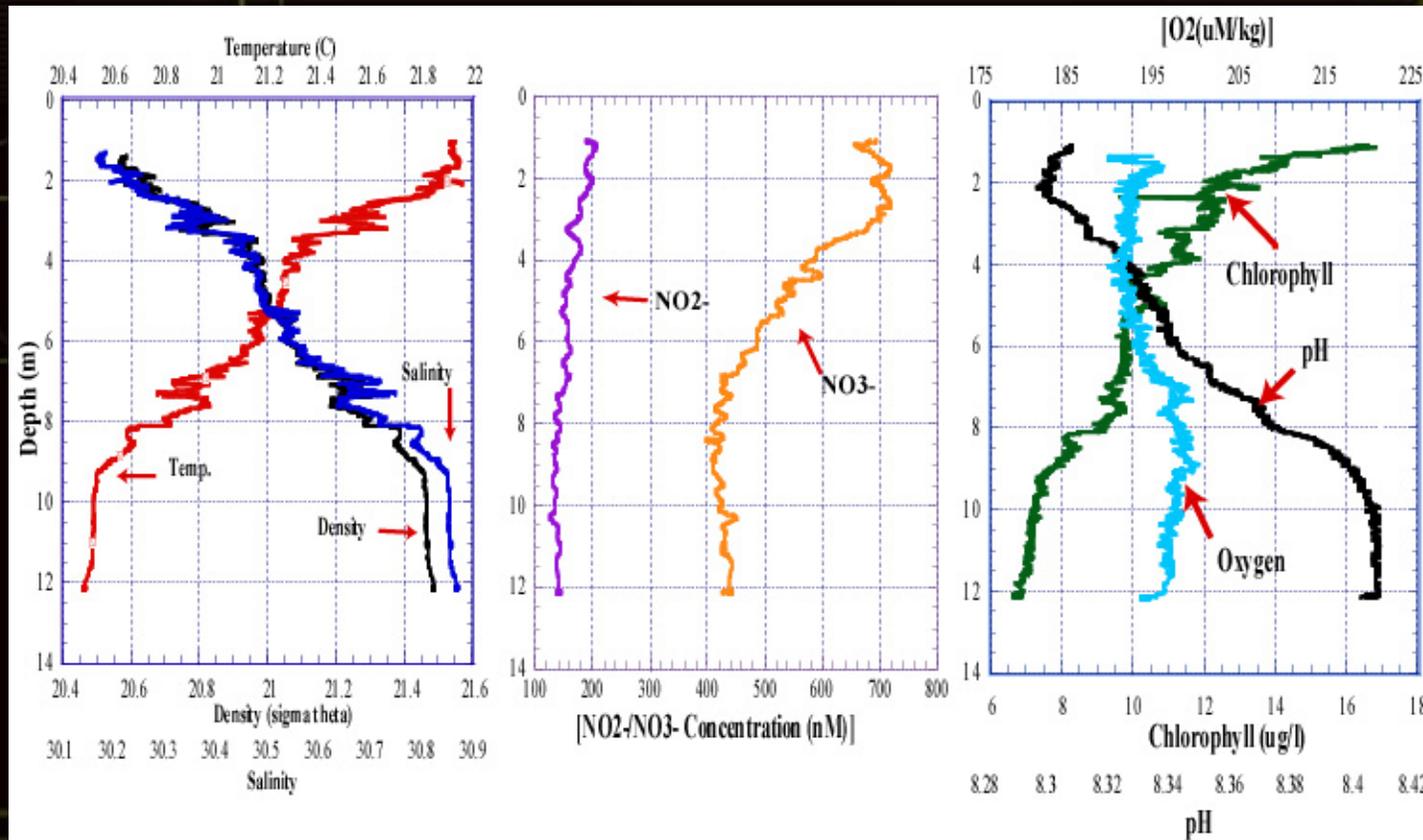
Advanced Monitoring Technologies



Development of new sensors to measure contaminants in sediment plumes in the Narragansett Bay NERR, RI

*Sub*Chem  *Systems, Inc.*

Z-Profiler

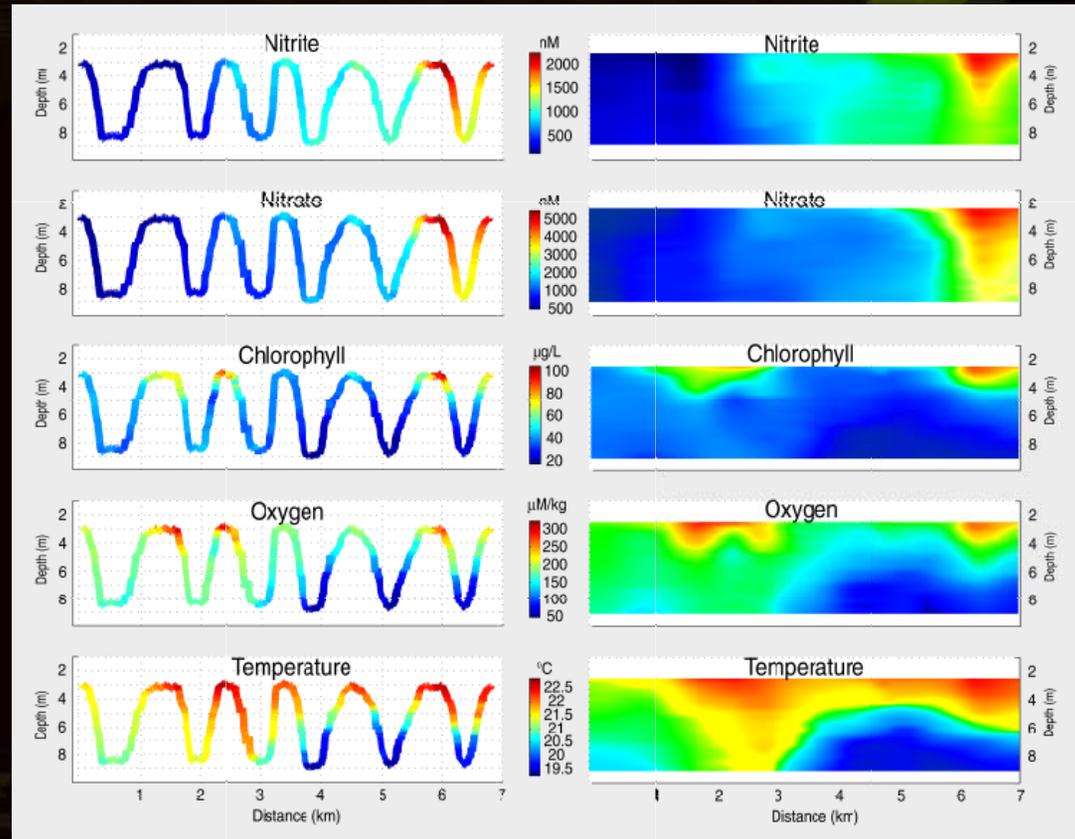


Vertical Profiles collected near Hope Island, RI 8/31/2000



SubChem Systems, Inc.

Chemical Plume Mapping with SubChem Systems *XZ-Profiler* Undulating Towed System



Advanced Monitoring Technologies



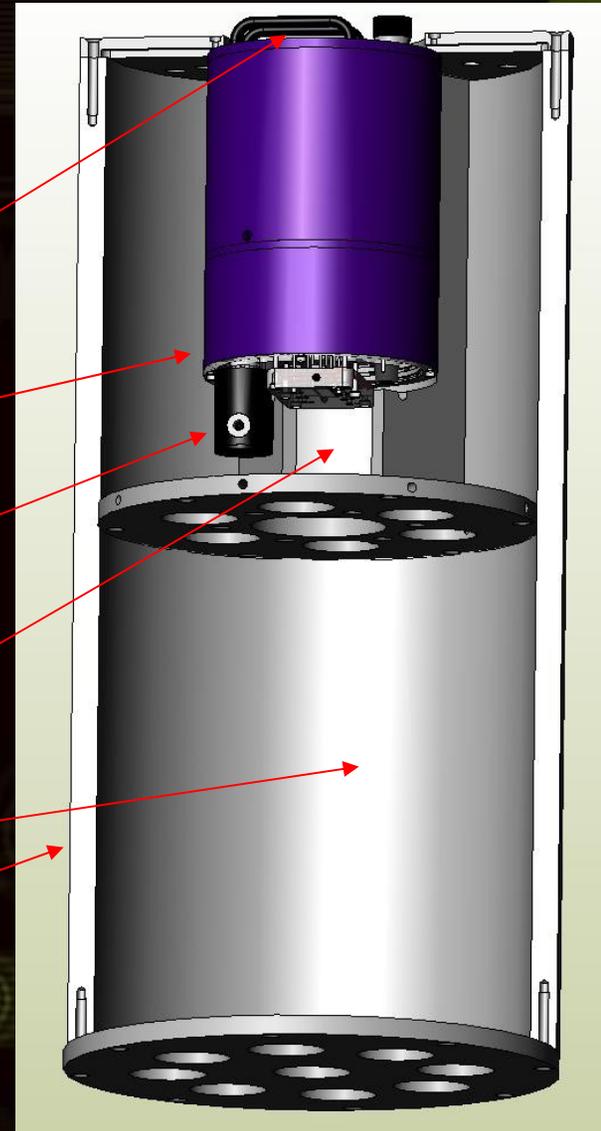
Continuous
nitrogen sensor

Elkhorn Slough, CA
South Slough, OR
Waquoit Bay, MA

YSI 9600 Nitrate Monitor

Instrument Overview

- User-replaceable sealed battery compartment
- Oil filled diaphragm pump housing
- User replaceable colorimetric detection cell
- Convenient storage for up to 6 liters of reagents
- Waste collection container up to 10 liters
- Secure flow-thru deployment housing



Product Features

Measured Parameters

NO₃ + NO₂

Detection Method

Cadmium reduction using diazotization

Detection Cell

2 mm and 10 mm pathlength cells

Power

Internal battery or external DCP

Battery Type

Lithium, field replaceable

Data Format

PC-6000 (.dat) and comma delimited text

Communication Interface

RS-232, SDI-12

Sample Interval

User programmable, 15 minutes minimum

Desktop Software

EcoWatch DC

PC interface

Terminal Window or EcoWatch DC

Data Logging

Internal or real time via external DCP

Product Specifications (Preliminary)

Range (2 mm cell)	0.05 mg/L – 8.0 mg/L
Lower Detection Limit (2 mm cell)	0.05 mg/L
Accuracy (2 mm cell) greater	± 5% or .05 mg/L, whichever is greater
Range (10 mm cell)	0.03 mg/L – 2.00 mg/L
Lower Detection Limit (10 mm cell)	0.03 mg/L
Accuracy (10 mm cell) greater	± 5% or .03 mg/L, whichever is greater
Deployment Life	30 days min @ 1 hour sample interval
Minimum sample interval	15 minutes
Battery Life	250 days @ 1 hour sample interval
Sample Volume	< 2 mL per sample
Deployment depth	0 – 200 feet
Operating temperature	1° - 45°C
Reagent Lifetime	4 – 10 weeks (depending on sample interval)
Waste Collection	In instrument, up to 10 liters

Nitrate Monitor Release Schedule

Beta Testing
2003
Release

June – September

August 2003

Anticipated Selling Price

\$17,5000

New Technologies for Seagrass Restoration



Scientists and engineers at URI are developing seed germination and bulking techniques and mechanized planting technology for large scale seagrass restoration

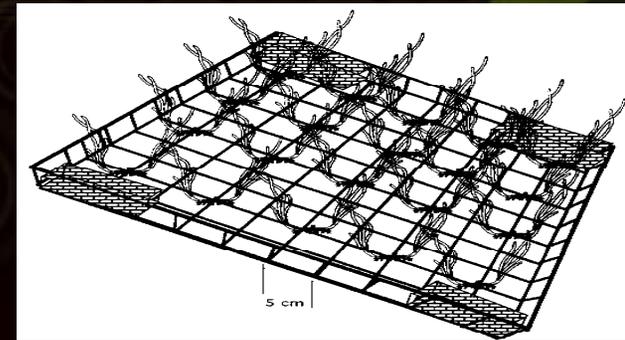
Restoration Techniques with Associated Cost Estimates

Staple



\$34,500 acre⁻¹

Turf



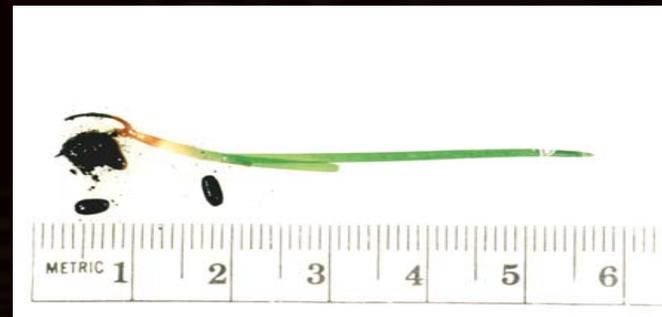
~\$15,000 acre⁻¹

Plugs / Peat Pot



\$15,250 acre⁻¹

Seeds



\$5,750 acre⁻¹

Cost of planting 1 acre at 250 shoots m⁻²

Seed Collection Process

Flowering plant
Collection



Plants are held while
seeds release



Vegetative material
are removed



Seed Collection Process (Cont.)

Tank Wash Down



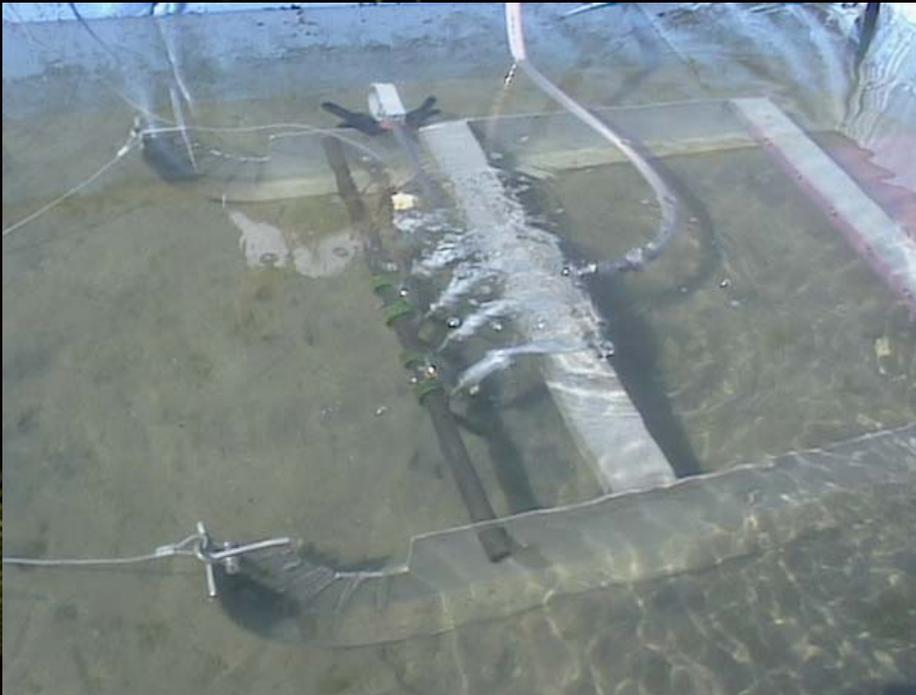
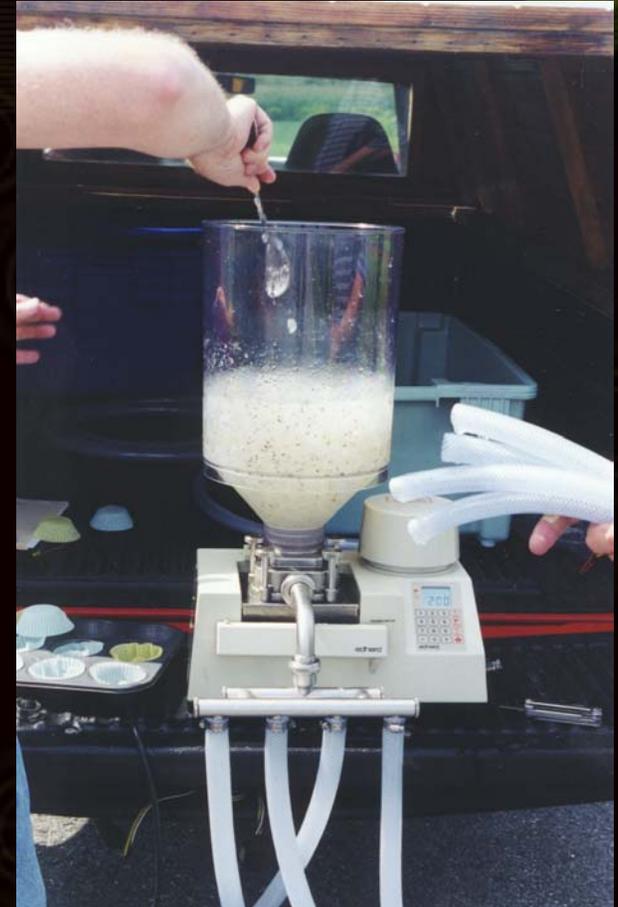
Seed Recovery



Seed Holding



Eelgrass restoration



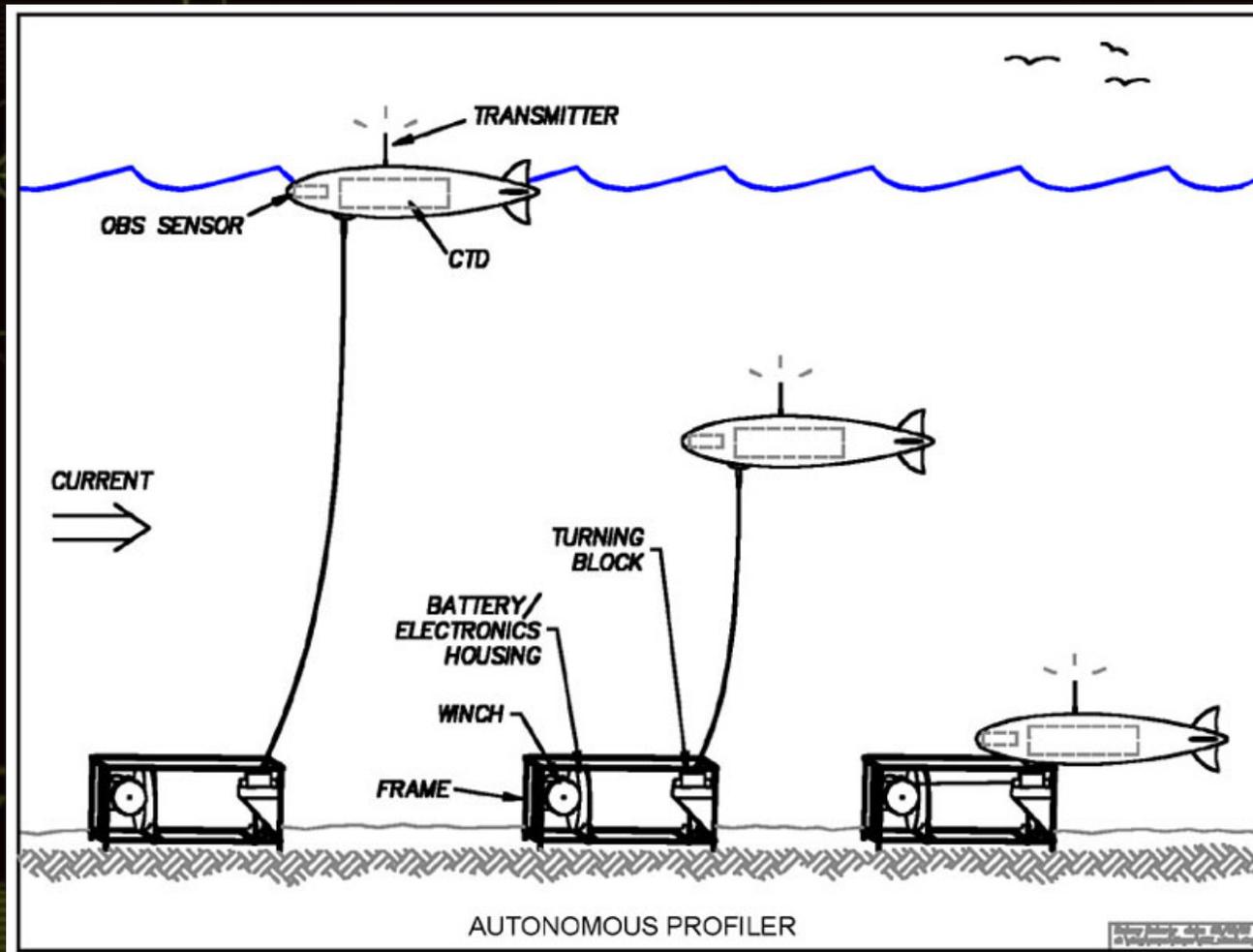


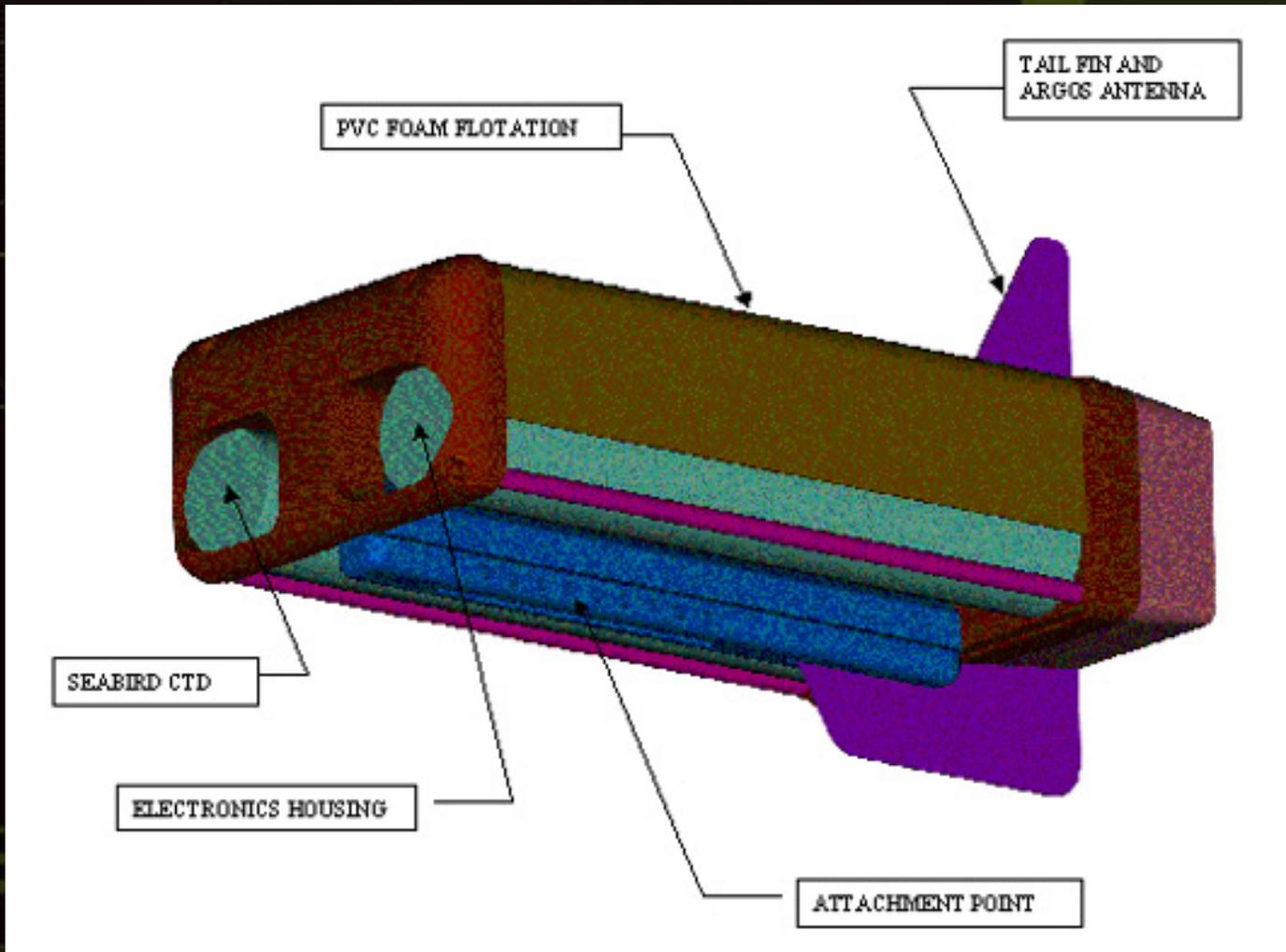
**A Practical Guide for the
Use of Seeds in Eelgrass
(*Zostera marina* L.)
Restoration**

**Part I: Collection,
Processing, and Storage**

Stephen Granger
Michael S. Traber
Scott W. Nixon
Raymond Keyes

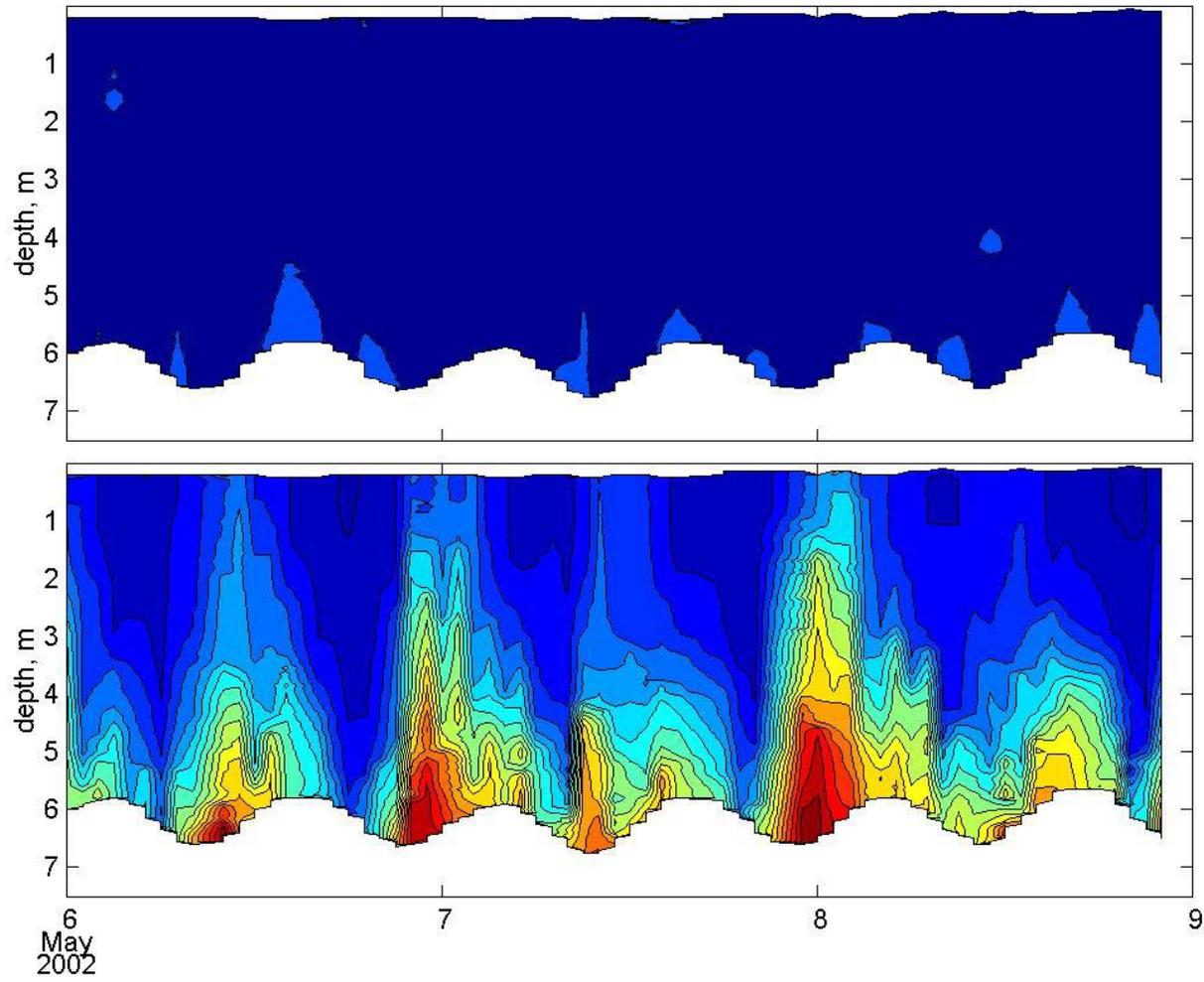
Autonomous Profiler







Undulator: turbidity and salinity



Project Explorer

- Searchable Database
- Project Information
- Project Products
- Fast and Informative
- Less Punishment for Searching
- Easy to Populate with New Project Products

ADVANCED SEARCH
LOCATION
ISSUES
TECHNOLOGY

Keyword:

Coordinator:

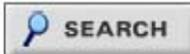
Issue:

Technology:

NERR:

State:

Year:



Welcome to the CICEET Project Explorer, where you can:

- Search the CICEET project database
- Read project progress reports
- Link to research web sites
- Get contact information for investigators
- And more!

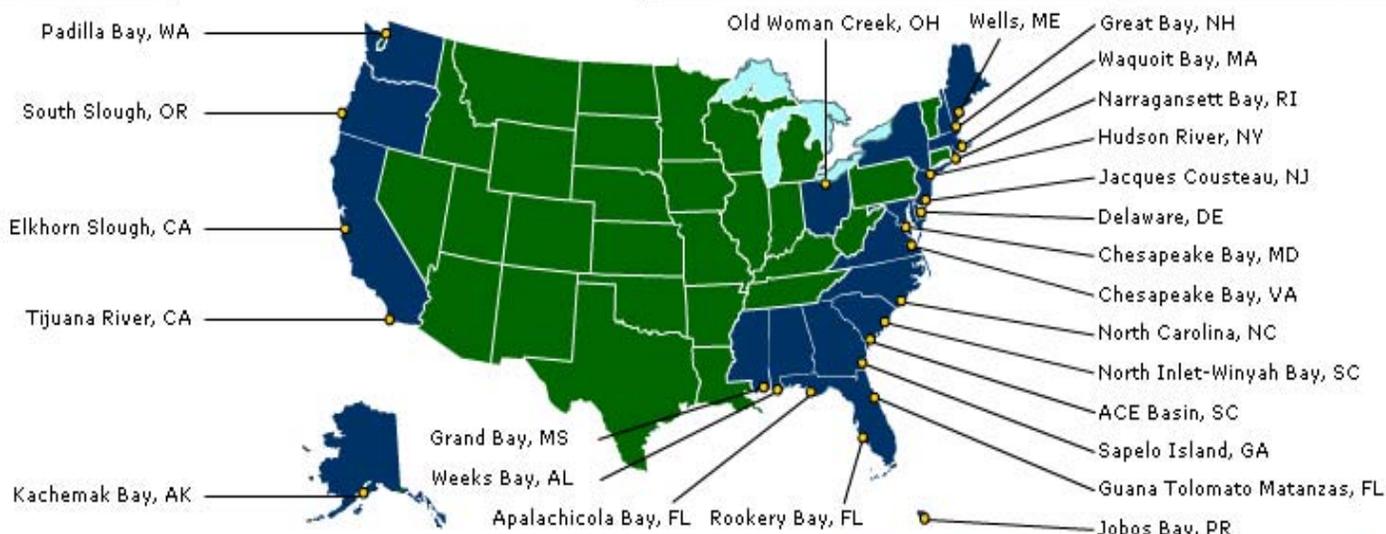
Please click on the "About" button at anytime if you would like more guidance on the Project Explorer. We welcome requests for additional information on specific projects or notification of new reports. We also welcome suggestions on how the Project Explorer can be improved. Please use our contact information at the bottom. Thank you.

CICEET/University of New Hampshire
 Environmental Technology, 35 Colovos Road
 Durham, New Hampshire 03824-3534
Phone: 603/862-3508 | **Fax:** 603/862-2940
Email: kalle.matso@unh.edu



Showing all 99 projects.

Title	Coordinator	Start	Status
Bathymetric Modeling and Interactive 3-D Visualization of the Great Bay Estuary	Mayer, Dr. Larry	2000	Ongoing
Modeling the Effects of Changes in Turbidity on Light Available for Submerged Aqu	Newell, Dr. Roger	1999	Awaiting Final Report
A Community Model for Chesapeake Bay	Li, Dr. Ming	2002	Ongoing
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An Autonomous Profiler for Estuarine Research and Monitoring	Geyer, Dr. W. R.	2000	Ongoing
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ADVANCED SEARCH
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ISSUES
TECHNOLOGY


Roll over the locations above for more information. Click a location to filter Projects Found below by that location.

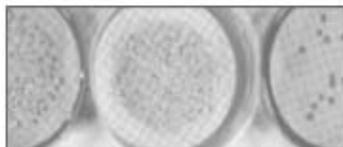
Click the 'Show All' button to view all projects.

[SHOW ALL](#)

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[ADVANCED SEARCH](#)
[LOCATION](#)
[ISSUES](#)
[TECHNOLOGY](#)
[Toxic Contaminants](#)

[Microbial Contaminants](#)

[Nutrient Enrichment](#)

[Habitat Loss Restoration](#)

[Data Synthesis/Integration](#)


Roll over the issues above for more information. Click an issue to filter Projects Found below by that issue.

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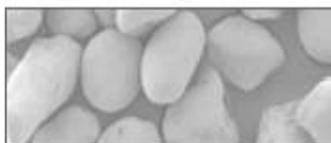
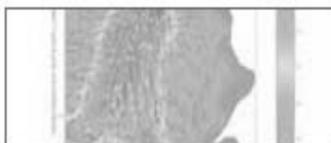
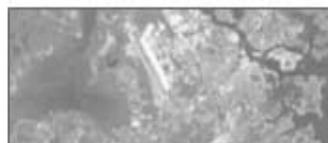
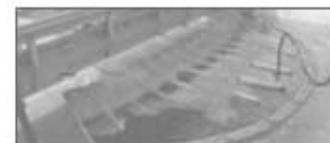
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ADVANCED SEARCH
LOCATION
ISSUES
TECHNOLOGY
Sensors/Probes

Management Tools

Restoration Technology

Pollution Remediation

Pollution Identification

Computer Models

Geospatial Tools

Pollution Prevention


Roll over the technology above for more information. Click a technology to filter Projects Found below by that technology.

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SHOW ALL

Showing all 99 projects.

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Keyword:

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State: Year:

LOCATION

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PROJECT DETAILS CLOSE WINDOW X

Lorum Ipsum Sed Dolare en Capsium de Kentum Funto en Darkin Sed Post Hoc Egro Proctor Hoc Ut Dignissum Molestie nostrud minim.



COORDINATOR:
[Dr. Funkenstien, University of NH](#)

ADDITIONAL INVESTIGATORS:
[Dr. Pierce](#), [Dr. Honeycut](#), [Dr. Burns](#)

YEAR:
 02/04/97 - Present

FUNDING:
 \$100,500.00

STATUS:
 On Going

PROJECT PROFILE

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PROJECTS FOUND

Your search for projects dealing with Microbial Contaminents issues, Bay NERR site, starting in the year of 1997 returned 99 results.

Project Title
Lorum Ipsum Sed Dolare en Seetum Sed Dolare en Seetum
Lorum Ipsum Sed Dolare en Seetum Sed Dolare en Seetum
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*PLEASE NOTE: Column widths are adjustable. Use Column headings to sort

PROGRESS REPORTS

Feb 2001
 Jul 2001
 Feb 2002
 Sep 2002
 Feb 2003

ADDITIONAL INFO

Pending...

PROJECT CATEGORIES

Issues
 - Microbial Contaminents
 - Toxic Contaminents
 Technology
 - Sensors/Probes
 State
 - NH

